

### **REMARKS**

Applicant hereby cancels claims 11 and 42 and adds claims 44-49. Accordingly, claims 1-10, 12-41, and 43-49 are pending in the present application.

Claims 1-43 stand rejected under 35 U.S.C. 102(e) for anticipation by U.S. Patent No. 5,982,144 to Johnson et al.

Applicant respectfully traverses the rejections and urges allowance of the present application.

Referring to claim 1, the Office Action relied upon the teachings of Johnson in support of the anticipation rejection. In particular, page 2 of the Office Action indicates support for the rejection is set forth in the abstract, Fig. 1, and col. 3, lines 1-46 of Johnson. Applicant disagrees.

Claim 1 positively recites *a plurality of electrochemical devices individually configured to assume an **open-circuit condition in a substantially charged state***. Claim 1 further recites a plurality of shunting devices individually configured to *shunt electrical energy from charging nodes **after the respective electrochemical device assumes the open-circuit condition***. Claim 1 is allowable.

Initially, the Office fails to identify any teachings which allegedly disclose an electrochemical device configured to assume an open-circuit condition in a substantially charged state. Further, Applicant has electrically searched Johnson and have failed to uncover any such teachings. Claim 1 is allowable for at least this reason.

Further, referring to Johnson at col. 1, lines 14-37, it is made clear Johnson is concerned with avoiding overcharging of cells. Col. 3, lines 27-33 of Johnson assures this operation by *providing the reference voltage of the shunt regulator 20 is less than the fully charged voltage of the battery to avoid overcharging*. Claim 1 recites the electrochemical devices configured to assume the open-circuit condition in the substantially charged state and the shunting devices individually shunt *after the respective electrochemical device assumes the open-circuit condition*. Johnson fails to disclose or suggest the electrochemical device assuming the open-circuit condition or the shunting after the electrochemical device assumes the open-circuit condition. Further, the provision of the shunt regulator threshold less the fully charged voltage of the battery precludes operation of the shunting after the electrochemical device assumes the open-circuit condition in the substantially charged state as claimed. Numerous positively-recited limitations of claim 1 are not shown nor suggested by the prior art and claim 1 is allowable.

In view of the failure of the Office to identify reference teachings corresponding to claim limitations, Applicant respectfully requests a **non-final Action** if claim 1 is not allowed in accordance with the CFR and at least for the reasons discussed further below.

The claims which depend from independent claim 1 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

For example, referring to claim 5, it is recited that the electrochemical device comprises a *lithium cell having a lithium-mixed metal electrode*. The specification refers

to the specifically-claimed lithium cell having the lithium-mixed metal electrode in paragraph 0023. Set forth in col. 3, lines 1-2 of Johnson, lithium ion type cells are disclosed. The disclosed lithium ion type cells fail to teach or suggest the claimed lithium cell *having the lithium-mixed metal electrode*. Further, the disclosed lithium ion type cells of Johnson fail to disclose or suggest the electrochemical device configured to assume the open-circuit condition in the substantially charged state. Claim 5 is allowable for these additional compelling reasons. Applicant requests a **non-final Action** if claim 5 is not allowed in accordance with the CFR and for the reasons discussed further below..

Claim 7 recites the passive shunting device has a breakdown voltage threshold greater than an end-of-charge voltage of the electrochemical device. Col. 3, lines 30-33 of Johnson clearly disclose *the reference voltage of the shunt regulator 20 **is less than the fully charged voltage of the battery***. The claimed passive shunting device of claim 7 is not shown nor suggested by the prior art and claim 7 is allowable for at least this reason.

The claims which depend from independent claim 7 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 14, Johnson mandates the avoidance of overcharging of a battery by shunting charging current away from the battery at a threshold less than the fully charged voltage of the battery as set forth in col. 3, lines 30-33. To the contrary, claim 14 recites *circuitry adapted to supply electrical energy to the electrochemical device via the*

*charging node **after** charging the electrochemical device to the end-of-charge voltage.*

This claimed circuitry is not shown nor suggested by Johnson.

Johnson also fails to disclose or suggest *circuitry configured to shunt electrical energy from the charging node after the supplying the electrical energy having the voltage greater than the end-of-charge voltage and after charging the electrochemical device to the end-of-charge voltage.* Numerous positively-recited limitations of claim 14 are not shown nor suggested by Johnson and claim 14 is allowable for at least this additional reason.

The claims which depend from independent claim 14 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

For example, claim 16 recites the circuitry configured to shunt comprises circuitry with *no control circuitry*. Paragraph 0031 of the specification describes devices *arranged to shunt without the use of associated control circuitry to control the operation of the shunting device in the plurality of operational modes*. The shunting circuits 20 of Fig. 1 of Johnson clearly have associated control circuitry comprising the voltage dividers R7 and R8 configured to control circuits 20 between conducting and non-conducting states. Positively-recited limitations of claim 16 are not shown nor suggested by Johnson and claim 16 is allowable. Applicant requests a **non-final Action** if claim 16 is not allowed in the next Action in accordance with the CFR and for the reasons discussed further below.

Referring to claim 20, Johnson discloses shunting electrical energy *at a threshold less than the fully charged voltage of the battery*. Claim 20 recites the *first circuitry adapted to supply electrical energy to an electrochemical device configured to operate as an open-circuit upon reaching a substantially charged state*. Johnson is devoid of teaching or suggesting the claimed circuitry supplying electrical energy to an electrochemical device configured to operate as an open-circuit at the substantially charged state. Further, Johnson fails to disclose or suggest the positively-claimed second circuitry *configured to shunt the electrical energy responsive to the electrochemical device operating as an open-circuit*. Numerous limitations of claim 20 are not shown nor suggested by the prior art and claim 20 is allowable for at least this reason.

The claims which depend from independent claim 20 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 25, Johnson clearly discloses shunting energy from a battery *at a threshold less than a fully charged voltage of the battery*. The use of a threshold less than the fully charged voltage of the battery teachings of Johnson fail to disclose or suggest charging an electrochemical device to the end-of-charge voltage of the electrochemical device as defined in claim 25. Claim 25 is allowable for at least this reason.

Further, Johnson discloses shunting at the threshold less than the fully charged voltage. This disclosed shunting fails to disclose or suggest applying electrical energy

having a voltage greater than the end-of-charge voltage to the electrochemical device **after** the charging the electrochemical device to the end-of-charge voltage as defined in claim 25. Numerous limitations of claim 25 are not shown nor suggested by the prior art and claim 25 is allowable.

The claims which depend from independent claim 25 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Referring to claim 30, Johnson fails to disclose or suggest providing electrical energy to an electrochemical device and the *electrochemical device assuming an **open-circuit condition** responsive to the electrochemical device obtaining a substantially charged state*. Claim 30 is allowable for at least this reason.

Johnson discloses shunting at a voltage threshold less than the fully charged voltage of the battery which fails to disclose or suggest the *shunting of electrical energy from a charging node after the electrochemical device assumes the open-circuit condition* as further recited in claim 30. Numerous limitations of claim 30 are not shown nor suggested by the prior art and claim 30 is allowable for this additional reason.

The claims which depend from independent claim 30 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Claim 37 recites providing an *electrochemical device comprising a lithium cell having a lithium-mixed metal electrode*. Johnson fails to disclose or suggest the claimed lithium cell having the lithium-mixed metal electrode. Further, the Office Action fails to identify any Johnson teachings which allegedly disclose or suggest the claimed lithium cell having the lithium-mixed metal electrode. Claim 37 is allowable for at least this reason.

The claims which depend from independent claim 37 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Claim 43 recites numerous limitations not shown nor suggested by the prior art. Initially, Johnson fails to disclose or suggest the *lithium cells individually having a lithium-mixed metal electrode* as claimed.

Johnson fails to disclose or suggest *charging the first lithium cell to the end-of-charge voltage* using the electrical energy in view of the shunting before the fully charged voltage is obtained of Johnson.

Johnson further fails to disclose or suggest applying the electrical energy having the voltage greater than the end-of-charge voltage to the first lithium cell *after the charging the first lithium cell to the end-of-charge voltage*.

The claimed shunting of Johnson fails to disclose or suggest *shunting the electrical energy using the at least one zener diode from the charging node of the first lithium cell to the charging node of the subsequent lithium cell after the charging and the applying as*

further recited in claim 43. Numerous limitations of claim 43 are not shown nor suggested by the prior art and claim 43 is allowable for at least this reason.

In the event that a rejection of the claims is maintained with respect to the prior art, or a new rejection made, Applicant respectfully requests identification ***in a non-final action*** of elements which allegedly correspond to limitations of the claims in accordance with 37 C.F.R. §1.104(c)(2). In particular, 37 C.F.R. §1.104(c)(2) provides that *the pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified*. Further, 37 C.F.R. §1.104(c)(2) states that the Examiner must cite the best references at their command. When a reference is complex or shows or describes inventions other than that claimed by Applicant, the particular teachings relied upon must be designated as nearly as practicable. The pertinence of each reference if not apparent must be clearly explained for each rejected claim specified. Applicant respectfully requests clarification of the rejections with respect to specific references and specific references teachings therein pursuant to 37 C.F.R. §1.104(c)(2) in a ***non-final*** Action if any claims are not found to be allowable.

Applicant hereby adds new claims 44-49 which are supported at least by Fig. 2 and the related teachings of the originally-filed application.

Applicant respectfully requests allowance of all pending claims.


The Examiner is requested to phone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).



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Respectfully submitted,

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